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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,954	03/22/2005	Mirko Lehmann	4587-048041	9156
<div>7590 John W McIlvaine Webb Ziesenheim Logsdon Orkin & Hanson 436 Seventh Avenue 700 Koppers Building Pittsburgh, PA 15219-1818</div>			<div>EXAMINER RAMILLANO, LORE JANET</div>	
			<div>ART UNIT 1797</div>	<div>PAPER NUMBER</div>
			<div>MAIL DATE 11/23/2007</div>	<div>DELIVERY MODE PAPER</div>

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/528,954	Applicant(s) LEHMANN ET AL.	
	Examiner Lore Ramillano	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

1. In applicant's reply filed on 9/6/07, applicant amended claim 17. Claims 17-36 are pending and under examination.

Response to Amendment

Prior art rejections

2. The rejections over the prior art are maintained.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 17, 19, 22, 25-27, and 35** are rejected under 35 U.S.C. 102(b) as being anticipated by Saini (US 5439647).

In Fig. 1C, Saini discloses a device (10) comprising: an optical waveguide (i.e. 20) on the surface of which several detection fields (i.e. 24) and multiple radiation receivers are disposed, each detection field including at least one receptor for contact a ligand to form a specific bond a specific bond with the ligand; at least one optical source of radiation, which is a semiconductor radiation source that is integrated into the semiconductor chip (i.e. 14); a semiconductor chip (12) having radiation receivers (16), each detection field having one radiation receiver associated therewith, each radiation receiver operative for detecting only the luminescence radiation sent out by the detection field associated therewith: wherein the waveguide is monolithically

integrated with the semiconductor substrate or is in the form of a waveguide layer located on the semiconductor chip; and the radiation receiver associated with each detection field is integrated into the semiconductor substrate facing the detection field directly on the backside of the waveguide facing away from the detection field. (column 2, lines 9-34).

In Figs. 1A and 2A, Saini further discloses a device (10) comprising: a semiconductor chip, laterally next to the waveguide, has an electronic circuit (i.e. 99, column 5, lines 28-35); a waveguide connected with the semiconductor chip at least at one bonding point (i.e. by gluing, column 1, lines 30-42); an adhesive coating (or polymer coating, column 1, lines 30-42); and an optical injection system provided in the emission area of the optical radiation source for deflecting optical radiation emitted by the optical radiation source to the waveguide (i.e. 28, 26, column 2, lines 17-34).

In Figs. 3A-3C, Saini discloses a device (58) comprising: an optical waveguide (i.e. 60) on the surface of which several detection fields (i.e. 60 and 30a) are located in which receptors are directly or indirectly immobilized, wherein when each receptor comes into contact with a ligand the receptor forms a specific bond with the ligand; at least one optical source of radiation, which is a semiconductor radiation source that is integrated into the semiconductor chip (i.e. 68); a semiconductor chip (56) that has at least one radiation receiver (70) on a semiconductor substrate: wherein the waveguide is monolithically integrated with the semiconductor substrate or is in the form of a waveguide layer located on the semiconductor chip; and the radiation receiver associated with each detection field is integrated into the semiconductor substrate facing the detection field directly on the backside of the waveguide facing away from the detection field. (column 3, lines 16-41).

In Figs. 3A-3C, Saini further discloses a device (58) comprising: an optical injection system, which is part of the waveguide and is provided in the emission area of the optical radiation source for deflecting optical radiation emitted by the optical radiation source to the waveguide (i.e. 61, 71, column 3, lines 23-33); and detection fields that are at some distance from one another and are positioned relative to the radiation receivers so each radiation receiver receives essentially no luminescence radiation from a detection field of an other radiation receiver (column 3, lines 23-40).

Additionally, Saini discloses alternative waveguides designed to provide for liquid waveguides, enabling the use of liquid sensing chemistries (flow-through measurement chamber, column 4, lines 55-57).

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. **Claims 18, 20-21, 23-24, 28, and 31-34** are rejected under 35 U.S.C. 103(a) as being unpatentable over Saini in view of Budach et al. ("Budach," US PG Pub. 2002/0135780).

While Saini does comprise a boundary surface, an adhesive coating (i.e. glue that bonds the waveguide to the substrate), and a waveguide that transmits light through the sensor, Saini does not specifically disclose a boundary surface running between two planes; an intermediate layer, and a waveguide made of polystyrene or silicon dioxide or tantalum pentoxide.

Budach disclose an embodiment, which has a boundary surface running between two planes (Fig. 2); an intermediate layer between the semiconductor chip and the waveguide, which has an optical index of refraction, a side of the intermediate layer adjacent the semiconductor

chip conforms to a surface of the semiconductor chip, and a side of the intermediate layer adjacent the waveguide is essentially plane (diffraction grooves, Fig. 2, [0109]; and a waveguide, which can be made of polystyrene ([0035]-[0036]) or tantalum pentoxide ([0109]-[0110]).

Saini and Budach are analogous art because they are from the same field of endeavor, which involves antibody chip technology. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Saini with the limitations of Budach, as stated above, because having the diffraction grooves, which are made of a specific dielectric material and have a particular depth, create an enhanced evanescent resonance condition, which evanescently excites fluorescent material that is on the surface or in the close vicinity of the layer and further causes the amplitude of the evanescent field at resonance position to be significantly greater than that of the prior art arrangements by an order of approximately 100. Moreover, under resonance conditions, when the laser energy is substantially confined to the thickness of the thin dielectric layer, the electrical field strength is increased. ([0111]-[0113]).

7. **Claims 28-30 and 36** are rejected under 35 U.S.C. 103(a) as being unpatentable over Saini in view of Haronian et al. ("Haronian," US 6465241).

While Saini discloses alternative waveguides designed to provide for liquid waveguides, enabling the use of liquid sensing chemistries (flow-through measurement chamber, column 4, lines 55-57), Saini does not specifically disclose an interior cavity of a flow-through measurement chamber and a Peltier element.

In Figs. 1-2, Haronian discloses a device (20) comprising: an optical waveguide (22), wherein receptors are located in an interior cavity (28) of a flow-through measurement chamber that has at least one inlet opening (24), one outlet opening (26), at least one reagent and/or

reaction partner for the detection of the bonding of at least one ligand to at least one receptor; and the semiconductor chip defines a wall area of the flow-through measurement chamber (column 5, lines 51 to column 6, line 54). Haronian further discloses utilizing a Peltier element (column 7, lines 53-61).

Saini and Haronian are analogous art because they are from the same field of endeavor, which involves antibody chip technology. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Saini with the limitations of Haronian, as stated above, because having the flow-through measurement chamber integrated with a chip would provide the monitoring means for monitoring, for example, PCR reactions in an automatable fashion, or preferably in real-time (column 2, lines 17-39). Furthermore, it would be advantageous to include a Peltier element to the device to provide a cooling means to cool the atmosphere surrounding the chip since PCR requires both rapid heating and cooling, i.e. thermal cycling, which would be provided by the reaction and the Peltier element.

Response to Arguments

8. Applicant's arguments filed on 9/6/07 have been fully considered but they are not persuasive.

In response to applicant's argument that Saini does not disclose, teach or suggest, multiple detection fields of bonding between receptors and ligands, examiner disagrees. As stated in the prior Office action filed on 6/4/07, Saini's sensing arm 25 (fig. 1C) reads on applicant's recited "multiple detection fields" and "each detection field including at least one receptor" since Saini's sensing arm 25 is made of sensing chemistry, which includes multiple detection fields of bonding between receptors and ligands. Saini's sensing chemistry further

reads on applicant's claimed multiple detection fields because applicant recited in claim 17, that each detection field includes at least one receptor. Saini's sensing chemistry, thus, comprises multiple detection fields because it comprises multiple receptors on the sensing chemistry.

With regard to the amended claim language in claim 17, Saini properly reads on such language since a claim containing a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus if the prior art apparatus teaches all the structural limitations of the claim. Here, because Saini teaches all the structural limitations of the claim, Saini reads on the intended use language.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lore Ramillano whose telephone number is (571) 272-7420. The examiner can normally be reached on Mon. to Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Lore Ramillano
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Art Unit 1797


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